

REMARKS

I. Introduction

This paper is in response to the Final Office Action mailed on October 26, 2005. Claims 1-23 are pending. Claims 1-23 stand rejected under 35 U.S.C. §103(a) as obvious over European Patent EP 014418 to Cesa et al. (“Cesa”) in view of U.S. Patent No. 5,744,650 to Nicholson et al. (“Nicholson”). Claims 1, 8 and 13 are amended herein in order to more particularly claim the invention disclosed by applicants. Claims 9 and 10 are cancelled.

II. Claims 1-8 and 11-23 are Not Obvious Over Cesa in View of Nicholson

A. Rejections Based on 35 U.S.C. § 103(a)

In rejecting Claims 1-8 and 11-23, the Examiner referenced an earlier Office Action in this case, where Cesa was characterized as: “disclos[ing] the preparation of 2-hydroxy carboxylic acid by the reaction of enol acetates with carbon monoxide and organic hydroxyl compounds . . .” (Office Action, Feb. 10, 2005 at 7-8.) The Examiner further stated: “Nicholson et al discloses a general carbonylation process . . . in the presence of carbon monoxide and palladium-organopolyphosphite ligand . . .” (*Id.* at 9.)

B. Neither Cesa nor Nicholson Disclose Use of a Nitrogen or Oxygen Containing Organic Compound as a Ligand to Increase Catalytic Activity

In order to prove a *prima facie* case of obviousness, the Examiner must present evidence that each element of the claimed invention was taught or suggested by the cited prior art. *In re Deuel*, 51 F.3d 1552, 1557 (Fed. Cir. 1995). Applicants respectfully submit that the above amendments alleviate any potential ambiguity in the claims in order to clarify the scope of the invention and the elements thereof. Cesa does not disclose the use of an additional nitrogen or oxygen containing organic ligand to modify activity of the phosphine palladium complex.

Further, neither Cesa nor Nicholson suggests the addition of this element. Importantly, Nicholson utilizes organophosphite complexes, in contrast to the phosphine complexes of the present invention. Thus, there is no reason to believe that even if each element of the claimed invention were taught by the prior art that there would be a suggestion to combine Cesa with Nicholson.

C. Secondary Considerations Show Non-Obviousness

Objective evidence such as commercial success, failure of others, long-felt need, and unexpected results must be considered *before* a conclusion on obviousness is reached and is not merely ‘icing on the cake’.” *Hybritech v. Monoclonal Antibodies*, 802 F.2d 1367, 1380 (Fed. Cir. 1986) (emphasis in original). The cited references teach away from the claimed invention and the invention exhibits unexpected results, clearly rebutting any showing of obviousness.

1. Nicholson Teaches Away From Phosphine Catalysis in a CO Environment

As illustrated in Nicholson, the catalytic activity of phosphine and phosphite ligands may be markedly different. Nicholson acknowledges the difference in sensitivity to carbon monoxide of products formed as the result of phosphite versus phosphine catalysis. *See* Nicholson at col. 30, ll. 17-20. Nicholson further points to the advantages of phosphites over phosphines and states that: “the organopolyphosphite modified metal catalysts do not undergo the type of catalyst deactivating clustering reactions characteristic of triphenylphosphine-modified metal catalysts.” Nicholson at col. 30, ll. 23-26. Thus, Nicholson teaches away from the presently claimed invention.

2. The Addition of a N or O Containing Ligand to a Palladium Phosphine Complex Achieved Unexpected Results

Although Cesa discloses the use of some palladium phosphine catalysts, the catalytic activity achieved thereby is rather low. This is in contrast to the presently claimed invention wherein the catalysts achieve high activity by the use of palladium phosphine complexes further comprising O and/or N containing organic ligands. The process of the claimed invention exhibits high catalytic activity (TON > 400) and allows the use of a rather high concentration ratio of hydroxyl compound to enol ester (i.e., 22.5/1), in contrast with Cesa, where the concentration ratio of hydroxyl compound to enol ester is not more than 10/1.

Thus, even if the Examiner had presented a *prima facie* case of obviousness, secondary considerations rebut this showing, in that the cited prior art taught away from the use of phosphine catalysts in a carbon monoxide environment and the presently claimed invention exhibits unexpectedly high catalytic activity.

III. Conclusion

In view of the above amendments and remarks, Applicants respectfully request that the rejections be removed and that the claims be allowed to issue.

Respectfully submitted,
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